

Modification of Upsilon production in nuclear collisions measured with sPHENIX

Upsilon provide an excellent probe for studying the screening length in the Quark Gluon Plasma through simultaneous observation of the $Y(1S)$, $Y(2S)$ and $Y(3S)$, using pp, pA and AA collisions. Unlike the charmonium states, the Y yield in AA collisions due to coalescence of bottom quarks produced in unrelated hard processes is expected to be small at both RHIC and LHC energies. Comparison of the Y modifications measured at RHIC and LHC therefore provides a relatively direct comparison of the effect of high energy density on three states of different radius and binding energy, at two different initial temperatures of the plasma. The sPHENIX experiment proposed at RHIC will be able to reconstruct Y states with a mass resolution of approximately 80 MeV, providing a clear separation of the three $Y(nS)$ states. In combination with the large acceptance of sPHENIX and the high luminosity at RHIC this will provide a high quality measurement of the modification for all three states. The results of simulations showing the performance of sPHENIX as an Upsilon detector will be described, and the expected quality of the measurements will be discussed.

Preferred Track

Future Experimental Facilities, Upgrades, and Instrumentation

Collaboration

sPHENIX

Primary author: Mrs SMITH, Krista (Florida State University)

Presenter: Mrs SMITH, Krista (Florida State University)

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